

# GREEN-Y ENERGY AG

SPARKING DEVELOPMENT OF A SUSTAINABLE ENERGY-STORAGE HEATING/COOLING SYSTEM WITH **3DEXPERIENCE** WORKS SOLUTIONS

## Case Study



Green-Y Energy accelerated development of its innovative, patented compressed air energy storage system for buildings and industry by adding **3DEXPERIENCE** Works modeling, design, collaboration, data management, communication, manufacturing, and training solutions to its existing SOLIDWORKS installation.

### Challenge:

Quickly and cost-effectively invent, develop, and pioneer a sustainable, patented energy storage, heating, and cooling system for use in residential, commercial, and industrial buildings that leverages advanced air compressor technologies.

### Solution:

Implement modeling, design, collaboration, data management, communication, manufacturing, and training solutions from the **3DEXPERIENCE Works** portfolio, which operate on the cloud-based **3DEXPERIENCE** platform.

### Results:

- Shortened development cycles
- Enhanced efficiency and security of data management
- Increased effectiveness of collaboration
- Reduced errors and related scrap and rework costs

Green-Y Energy AG invented and is developing an innovative, patented compressed air energy storage system (CAES) for buildings and industry. Based in Hasle, Switzerland, and founded in 2020, the company is contributing to the ongoing energy transition with sustainable energy solutions. Green-Y is supported by investors and also receives funding via research projects funded by Innosuisse (the Swiss Innovation Agency) and the Swiss Climate Foundation, which are conducted in concert with leading Swiss universities. The company's energy storage system essentially combines a battery and a heat pump in a sustainable way into a single system: It stores electricity — whether generated by rooftop solar panels, wind turbines, or the grid — using its patented compressed air technology.

When charging the storage system, air is compressed using electricity and stored in compressed air cylinders at up to 300 bar (4,351 psi). The compression produces heat at a temperature of up to 60° C (140° F), which can be used for building heating or hot water preparation, or as process heat. When the storage tank is discharged, the air from the storage cylinders is expanded and generates electricity via a generator. During the expansion, the temperature drops to as low as 3° C (37.4° F),



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— Patrick Baumann, Chief Technology Officer

and the resulting cold can be used for room cooling, server cooling, or as process cooling.

Green-Y successfully implemented a pilot plant with a total capacity of 100 kWh in 2023, suitable for use in residential areas, offices, commercial buildings, and industrial facilities. The system stores solar photovoltaic (PV) electricity from a commercial site and serves to optimize self-consumption. Reaching this milestone so quickly demanded an agile, flexible, and collaborative development platform, according to co-Founder and Chief Technology Officer (CTO) Patrick Baumann.

"It was necessary from the beginning that we carefully use the resources available to us," Baumann recounts. "As we continuously developed new prototypes, the amount of SOLIDWORKS® CAD data that had to be efficiently integrated into the existing processes increased significantly, creating data management, resource optimization, collaborative work, and scalability challenges. It was obvious that we needed a solution that would meet our specific requirements, including ease of implementation, to move our operations forward."

Green-Y evaluated solutions that would enable it to continue to leverage its existing SOLIDWORKS CAD data while addressing its growth challenges and decided to implement modeling, design, collaboration, data management, communication, manufacturing, and training solutions from the **3DEXPERIENCE® Works** portfolio. The **3DEXPERIENCE Works** product innovation portfolio leverages the cloud-based **3DEXPERIENCE** platform to give customers access

to the power of industry-leading tools for design, simulation, manufacturing, data management, and marketing from Dassault Systèmes.

“We chose the **3DEXPERIENCE** platform because it has several key factors that are particularly beneficial for us,” Baumann explains. “The cloud-based flexibility of the platform enables high accessibility and scalability, as well as transparent data management. Access to the tools and data needed is possible from anywhere, which is particularly beneficial when working in a remote environment. Cost efficiency is also a crucial factor. Compared to on-premises solutions, a cloud platform requires less investment in IT infrastructure and maintenance. This keeps operating costs low and allows us to use resources more efficiently.”

### EASE OF IMPLEMENTATION SPURS DEVELOPMENT

Because **3DEXPERIENCE** Works solutions are easy to implement and use and are fully compatible with SOLIDWORKS CAD data, Green-Y realized efficiency gains almost immediately upon implementation. “The system had to be quick to implement and adaptable to the specific needs of our company without incurring high costs or a long learning curve,” Baumann stresses.

“The **3DEXPERIENCE** platform met these requirements and offered a cloud-based, scalable solution specifically tailored to our needs,” Baumann continues. “With the **3DEXPERIENCE** platform, we were able to make better use of our resources, improve collaboration, accelerate product development, and increase the quality of prototypes. The platform has thus proven to be a crucial tool for generating sustainable growth and efficiently implementing our innovations.”

### MORE EFFECTIVE COLLABORATION WITH PARTNERS

Green-Y needed a system that would make collaboration more effective — both internally and externally. The company’s development team consists of in-house designers, who design parts and create CAD models, and external specialists, who conduct



With **3DEXPERIENCE** Works product development solutions on the cloud-based **3DEXPERIENCE** platform, Green-Y Energy has improved the effectiveness of collaboration with internal designers and external partners, while simultaneously increasing productivity and boosting quality.

finite element analysis. “Teamwork is a crucial factor in driving innovation, so a solution was sought that would promote the flow of information and facilitate communication between the different departments and with external partners,” Baumann notes.

“For example, the collaboration between our internal designers and the external specialists is an essential part of our development process,” Baumann explains. “The [**3DEXPERIENCE**] platform enables the models to be stored centrally so that everyone involved can access them in real time. As part of the analysis and optimization, a series of simulations are carried out, including finite element analyses, to check the structural integrity. This type of collaboration has dramatically improved and become more effective using **3DEXPERIENCE** Works solutions.”

## PRODUCTIVITY AND QUALITY IMPROVEMENTS

Since implementing **3DEXPERIENCE** Works solutions, Green-Y has also realized gains in productivity, leading to shorter development cycles, as well as increased quality, resulting in greater design reuse and reduced scrap and rework costs. "The introduction of the **3DEXPERIENCE** platform has enabled us to significantly increase our efficiency and productivity as central data storage, transparent data management, and improved collaboration have led to a measurable increase in productivity," Baumann points out.

"In addition, we have been able to noticeably increase the reuse rate of designs. This reuse of proven design patterns and modules leads to an additional shortening of our development cycles. Last but not least, expanded simulation options and more precise documentation on the **3DEXPERIENCE** platform have led to a reduction in design errors, and scrap and rework costs, which can be quite costly," Baumann says.

### Products:

- **3DEXPERIENCE SOLIDWORKS** Standard
- Collaborative Industry Innovator
- 3D Creator
- Manufacturing Definition Creator
- **3DEXPERIENCE** Works Learner
- 3DSwymer

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## Our **3DEXPERIENCE**® platform powers our brand applications, serving 11 industries, and provides a rich portfolio of industry solution experiences.

Dassault Systèmes, the **3DEXPERIENCE** Company, provides business and people with virtual universes to imagine sustainable innovations. Its world-leading solutions transform the way products are designed, produced, and supported. Dassault Systèmes' collaborative solutions foster social innovation, expanding possibilities for the virtual world to improve the real world. The group brings value to over 250,000 customers of all sizes in all industries in more than 140 countries. For more information, visit [www.3ds.com](http://www.3ds.com).



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